

## **ITEM 17203.74 M - TEMPORARY ROCK CATCHMENT BARRIER – 3 M HIGH**

### **DESCRIPTION**

The Contractor shall furnish, install, move, maintain, and remove the temporary rock catchment barrier in accordance with this specification, where indicated on the contract plans, as shown in drawings TRCB-1 and TRCB-2 or as ordered by the Engineer.

### **MATERIALS**

The temporary rock catchment barrier shall be composed of precast concrete barrier units, support columns, wire rope netting, and all described appurtenances. The netting shall be either as manufactured by Brugg Cable Products, Inc. or an approved equivalent.

#### **1. Precast Concrete Barrier Units**

The precast concrete barrier units shall consist of three (3) components: precast concrete column supports, precast temporary concrete barriers, and precast concrete beams (see DETAILS “A” and “B”).

**A. Precast concrete column supports** shall conform to the dimensions and details shown in DETAILS “F”, “G”, “H”, “I” and “L”. Additional joint connection details shall be as shown on standard sheet M619-3R1, Temporary Concrete Barrier. Material and fabrication details shall conform to the requirements of Subsection 704-05, Precast Concrete Barrier, of the NYSDOT Standard Specifications.

Each column support shall have cast-in-place a 152 mm x 152 mm x 6.4 mm structural steel tube to be used for support of the wire rope rock fence. The tube steel shall conform to the requirements of ASTM A500, Grade B or C, and shall conform to the dimensions and details shown in DETAIL “N”.

**B. Precast temporary concrete barriers** (see DETAIL “E”) shall conform to the dimensions, joint connections, material details, and anchoring details shown on standard sheet M619-3R1. The Manufacturer shall certify that the temporary concrete barrier units conform to the details shown on the standard sheet or approved drawing. The 6096 mm barrier sections shall conform to the requirements of Subsection 704-05, Precast Concrete Barrier, of the NYSDOT Standard Specifications.

**C. Precast concrete beams** shall conform to the dimensions shown in DETAILS “K” and “M”. Material and fabrication details shall conform to the requirements of Subsection 704-05, Precast Concrete Barrier, of the NYSDOT Standard Specifications.

The Engineer will inspect all precast concrete barrier unit components upon delivery to the project site for conformance to specifications. Any barrier unit component having damage and/or defects in the concrete and/or joint connections will be rejected by the Engineer, when in his judgement, the performance of the barriers will be affected.

The precast concrete barrier units shall form a smooth and continuous barrier when joined together. Any sections damaged or misaligned while in service shall be corrected or replaced to the satisfaction of the Engineer.

#### **2. Net Support Columns**

The support columns shall be fabricated from W130 x 24 wide flange members (see DETAIL “D”) conforming to the requirements of ASTM A36M for preformed shapes.

Each support column shall have four (4) pairs (eight holes) of 25 mm diameter holes drilled on the side facing the rock slope (see DETAILS “B”, “D” and “E”). Two (2) holes shall be situated 75 mm from the top of the post and the remaining three (3) pairs spaced equally approximately 1015 mm apart.

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After any required drilling, welding and/or cutting, all support columns and related hardware shall be hot dipped galvanized in accordance with ASTM A123M. The fabricator shall grind smooth all burrs and rough surfaces prior to galvanizing.

### **3. Net Support Ropes**

The 16 mm diameter net support rope used to hang the wire rope net (see DETAIL “B”) shall be of 6 x 19 construction with a minimum breaking strength of 165 kN. The net support rope shall be galvanized.

### **4. Wire Rope Netting**

All net wire shall be composed of steel wires that have been individually galvanized prior to being braided into the designated wire rope configuration.

The wire rope net shall be fabricated in accordance with the following specification: The 8 mm diameter mesh rope shall be of 7 x 7 construction with a minimum breaking strength of 41 kN. The net shall be diagonally woven with a mesh size of 200 mm x 200 mm. The 16 mm diameter perimeter cable shall be woven through the outer loops of the wire rope net and secured at each point of contact with a heavy-duty aluminum stop sleeve. The 16 mm diameter perimeter cable shall be galvanized, of 6 x 19 construction, with a minimum breaking strength of 165 kN.

Two (2) aluminum stop sleeves shall be used at all locations where two individual wire ropes are joined together.

The 200 mm x 200 mm mesh size shall be fabricated using high strength, hot dipped, galvanized steel clips, which are attached so that they are non-moveable. Nets damaged during clipping shall be rejected by the Engineer.

### **5. Chain Link Fence Fabric**

Nets shall be covered with nine (9) gauge chain link fence fabric to prevent debris smaller than 200 mm from penetrating the fence. The galvanized chain link fence fabric shall have a 50 mm mesh size, shall be 3658 mm high (see DETAIL “E”), and shall conform to the requirements of Subsection 710-02, Galvanized Steel Fence Fabric, of the NYSDOT Standard Specifications. The chain link fence fabric shall be continuous between wire rope net panels (see DETAIL “B”).

### **6. Synthetic Fabric Layer**

An additional layer of synthetic fabric, 3200 mm in height (see DETAIL “E”), shall be attached to the chain link to stop airborne debris smaller than 50 mm from penetrating the fence. The synthetic fabric shall appear on the Approved List issued by the Department’s Materials Bureau for Item 207.10 M, Geotextile Bedding.

### **7. Cushion Sand**

The sand as shown in DETAIL “E” shall conform to the requirements of Subsection 703-06, Cushion Sand, of the NYSDOT Standard Specifications.

### **8. Miscellaneous Material**

All miscellaneous hardware such as shackles, thimbles, wire clips, bolts, etc. (see DETAIL “J”) shall be hot dipped galvanized.

## **CONSTRUCTION DETAILS**

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The Contractor shall furnish, install, move, and maintain the temporary rock catchment barrier where indicated on the contract plans, as shown on the standard sheets, as shown in drawings TRCB-1 and TRCB-2 or as directed by the Engineer.

### **1. Precast Concrete Barrier Units**

Each run, or bay, of precast concrete barrier units (precast concrete column support, precast temporary concrete barrier and precast concrete beam) shall be fastened together to form a continuous chain. After placement each successive unit shall be moved longitudinally to remove any slack in the connecting joint. The units at each end of a run or bay shall be connected as shown on standard sheet M619-3R1. To reduce movement of the barrier in areas where limited deflection is desired, or where directed by the Engineer, one of the anchoring methods shown on standard sheet M619-3R1 shall be used. Where shown on the plans or directed by the Engineer, the ends of the barrier run shall be fitted with an impact attenuation device or a tapered end section and flared back as directed.

The empty space within each concrete barrier unit shall be filled with sand for the full height (813 mm) of the unit. The back of the concrete barrier units shall also be covered with sand to the full height of the unit. The sand shall then be laid back at the angle of repose of the material to a minimum sand thickness of 457 mm as shown in Detail "E". The cost of installing and removing the sand, including the final cleaning of the pavement and shoulder, shall be included in the bid price for this Item.

The Contractor shall provide and maintain delineation of temporary barriers. This delineation shall make the barrier visible to approaching traffic, as well as to traffic which is adjacent to the barrier. The Contractor shall have the choice of using one or more of the following: warning lights, delineators, pavement marking, reflective tape placed on the barrier, reflective paint, or any other device subject to the approval of the Engineer. The delineation devices shall be maintained dirt and snow free, and be visible throughout the term of the contract including shutdown periods.

### **2. Net Support Columns**

The W 130 x 24 posts shall be installed in the 152 mm x 152 mm x 6.4 mm structural steel tubes cast in the precast concrete column support units. The columns shall be inserted flush with the bottom of the precast concrete column supports (see DETAIL "E").

### **3. Net Support and Lateral Anchor Ropes**

The 16 mm net support wire ropes shall be installed as shown in DETAIL "B". The net support wire rope shall have maximum sag of 50 mm. At both end sections and at every 38.1 m section of temporary catchment barrier (five precast concrete barrier units) install lateral anchors as shown in DETAIL "C". The wire rope loop at a 19 mm shackle connection shall be secured with three (3) wire rope clips as shown in DETAIL "J".

### **4. Rock Catchment Fence Fabric**

The rock catchment fence fabric (wire rope net, chain link fence fabric and synthetic fabric) shall be attached to the support rope after the concrete barrier units have been installed in a manner acceptable to the Engineer.

The wire rope net panels shall be attached to the support ropes with 13 mm shackles spaced approximately 900 mm apart. The chain link fence fabric, 3658 mm in height, shall be attached to the wire rope net with hog rings, twist ties, or in a manner approved by the Engineer. The area between two adjacent wire rope net panels shall be covered with chain link fence fabric in a manner approved by the Engineer. The layer of synthetic fabric, with a minimum height of 3200 mm, shall be attached to the chain link fence in a manner approved by the Engineer.

## **METHOD OF MEASUREMENT**

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The quantity to be paid for the temporary rock catchment barrier will be the number of linear meters of barrier measured along the centerline of the uppermost concrete barrier surface, from one end anchor to the other, properly furnished and installed in accordance with the plans and specifications and directions of the Engineer.

**BASIS OF PAYMENT**

The unit bid price per meter of barrier shall include all material, equipment and labor necessary to erect, maintain and remove the required barrier, including any required connection devices, and treatments, delineation or guiding devices and devices for pinning and connecting temporary precast concrete barrier units.

After placement, payment will be made for ninety (90) percent of the quantity of barrier furnished and erected in accordance with the contract requirements. The remaining ten (10) percent will be paid upon removal.

DISAPPROVED BY EI 10-002